

"APPROVED FOR RELEASE: 07/19/2001

CIA-RDP86-00513R000514320012-3

AMATUNI, A.TS.; GARIBYAN, G.M.

Development of theoretical physics in Soviet Armenia. Iz ist.est.i  
tekhn. 2:45 '62.  
(MIRA 18:4)

APPROVED FOR RELEASE: 07/19/2001

CIA-RDP86-00513R000514320012-3"

GARIBYAN, G.M.; KARAPETYAN, R.V.

Motion of a charge along the axis of an inhomogeneous cylindrical dielectric. Izv. AN Arm.SSR.Ser.fiz.-mat. nauk 16 no.5:99-105 '63.  
(MIRA 16:11)

1. Yerevanskiy gosudarstvenny universitet.

"APPROVED FOR RELEASE: 07/19/2001

CIA-RDP86-00513R000514320012-3

AMATUNI, A.TS.; GARIBYAN, G.M.; EIBAFYAN, S.S.

Radiation from a charge, variable with time, moving in a  
medium at constant speed. Izv. AN Arm. SSR. Ser. fiz.-mat.  
nauk 16 no.6:101-112 '63. (MIRA 17:8)

APPROVED FOR RELEASE: 07/19/2001

CIA-RDP86-00513R000514320012-3"

S/252/63/056/002/001/003  
D218/D308

AUTHORS: Garibyan, G.M. and Nagomedov, M.R.

TITLE: Radiation emitted by an arbitrarily moving particle moving at right angles to the boundary of separation of two media

PERIODICAL: Akademiya nauk Armyanskoy SSR. Doklady, v. 36, no. 2, 1963, 77-81

TEXT: Ginzburg and Frank (ZhETF, 16, 16, 1946) have shown that when a charged particle passes through the separation boundary between two media, a transition radiation is emitted. It is noted that in all previous calculations the velocity of the particle was assumed to be constant. The aim of the present work was to investigate the effect of irregular motion of the particle on the transition radiation. In a previous paper (ZhETF, 38, 18, 66, 1960) the first of the present authors studied this problem for an ultra-relativistic particle and high frequencies. The present theory is a generalization of these calculations to arbitrary velocity frequen-

Card 1/2

Radiation emitted ...

S/252/63/036/002/001/003  
D218/D308

cies. A general expression is obtained for the vector potential in both media as a function of time. These formulas become identical with the formulas for constant velocity only when the particle comes to rest at infinity. There is 1 figure.

ASSOCIATION: Fizicheskiy institut (Physics Institute)

PRESENTED: by A.N. Alikhanyan, Academician AS Arm.SSR

SUBMITTED: October 17, 1962

Card 2/2

L 17633-63Pah-4 GG/JDS/056/63/044/003/050/053  
ENT(1)/EWP(q)/ENT(m)/BDS/ES(w)-2 AFFIC/ASD/IJP(C)/SSD

72

AUTHOR: Alikhanyan, A. I., Garibyan, G. M., Lorikyan, M. P., Val'ter, A. K.,  
Grishayev, I. A., Petrenko, V. A., and Fursov, G. L.TITLE: Ionization energy losses of fast electrons in thin films

16

PERIODICAL: Zhurnal eksperimental'noy i tekhnicheskoy fiziki, v. 44, no. 3,  
1963, 1122-1124

TEXT: G. M. Garibyan (Ref. 1: ZhETF, 37, 527, 1959) showed that whenever a charged particle passes through a sufficiently thin film, its electric field is the same as in the vacuum. Consequently, within such a layer the particle produces ionization as if there is no screening effect due to the medium, i.e., the density effect is not present. The measurements were carried out on the linear accelerator of the Fiziko-tehnicheskiy institut Akademii nauk SSSR (Physico-Technical Institute of the AN USSR) using a battery of thin films to obtain the total losses with a sufficient accuracy and minimum fluctuations. The results are shown on Fig. 2. The results for a very thin film agree with the theoretical curve derived in Ref. 3 (R. M. Sternheimer, Phys. Rev., 103, 511, 1956). There are 2 figures.

Card 1/2

L 17633-63

S/056/63/044/003/050/053

## Ionization energy losses...

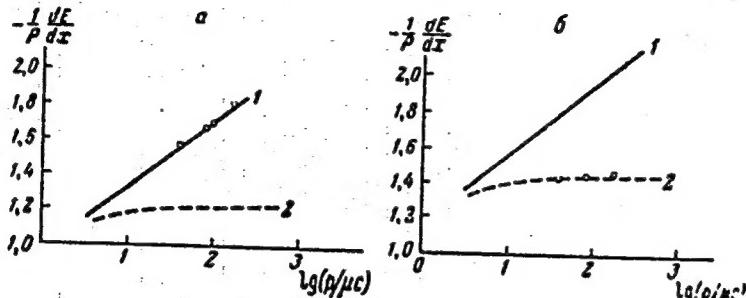


Fig. 2. Theoretical curves and experimental values for losses of energy in polystyrene (a)  $10^{-6}$  cm thick and (b)  $2 \cdot 10^{-3}$  cm thick. 1 - Theoretical curve neglecting density effects; 2 - theoretical curve taking care of the density [polarization] effects. Circles denote experimental results. The ordinate represents the specific transmission in relative units. [Curves are normalized at the 40 Mev electron energy points and the standard experimental error is 1%.]

SUBMITTED: January 7, 1963

Card 2/2

GARIBYAN, G.M.; MAGOMEDOV, M.R.

Radiation from an arbitrarily moving particle perpendicularly intersecting the interface of two media. Dokl. AN Arm. SSR 36 no. 2:77-81 '64. (MIRA 17:3)

1. Fizicheskiy institut AN Armyanskoy SSR. Predstavлено akademikom AN Armyanskoy SSR A.N.Alikhanyanom.

ACCESSION NR: AP4031140

S/0056/64/0046/004/1212/1215

AUTHORS: Alikhanyan, A. I.; Val'ter, A. K.; Garibyan, G. M.; Grishayev, I. A.; Lorikyan, M. P.; Petrenko, V. V.; Fursov, G. D.

TITLE: Ionization energy losses of fast electrons in thin polystyrene layers

SOURCE: Zh. eksper. i teor. fiz., v. 46, no. 4, 1964, 1212-1215

TOPIC TAGS: polystyrene, ionization loss, electron bombardment, polarization

ABSTRACT: The dependence of the electron ionization energy loss on the electron momentum was investigated experimentally as a continuation of earlier work (ZhETF v. 44, 1122, 1963) with polystyrene films of different thickness. In the present work the polystyrene film thicknesses were  $10^{-5}$ ,  $2 \times 10^{-5}$ , and  $2 \times 10^{-4}$ . The measurement procedure is described. On the basis of these and the earlier mea-

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ACCESSION NR: AP4031140

surements it is concluded that in the 20--86 MeV range the electron ionization energy losses in polystyrene films of thicknesses equal to or less than the critical value are in good agreement with the theoretical prediction of G. M. Sibyan (ZHEM v. 37, 527, 1953). At thicknesses greater than critical, the influence of the polarization begins to be felt and increases with thickness. "The authors are grateful to Professor V. M. Kharitonov and V. I. Startsev for help with the work, and to the accelerator crew."

ASSOCIATION: Fizicheskiy institut GKAE, Yerevan (Physics Institute GKAE). Fiziko-tehnicheskii institut AN UkrSSR (Physicotechnical Institute AN UkrSSR)

SUBMITTED: 19Oct63

DATE ACQ: 07May64

ENCL: 01

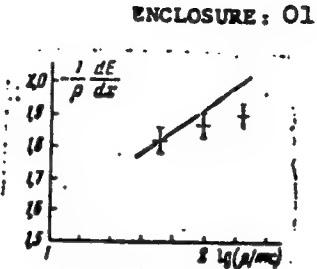
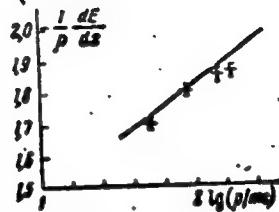
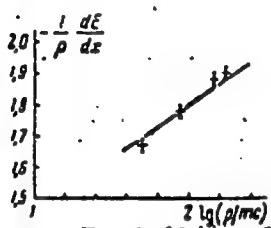
SUB CODE: GP, NP

NR RPP Sov: 003

OTHER: 001

Card 2/3

ACCESSION NR: AP4031140



Theoretical curves and experimental values (+) of electron energy loss in a polystyrene film (film thickness, left to right:  
 $10^{-5}$ ,  $2 \times 10^{-5}$ , and  $2 \times 10^{-4}$  cm)

3/3

I 40790-65 EWT(1)/EPA(s)-2/EWT(m)/EEC(t)/EWP(t)/EWP(b) Pt-10 IJP(c)  
 ACCESSION NR: AP5008830 JD/GG S/0252/65/040/001/0021/0024

AUTHORS: Garibyan, G. M. (Corresponding member AN ArmSSR); Lorikyan, M. P.

TITLE: On the theory of ionization energy loss in thin film substances

SOURCE: AN ArmSSR. Doklady, v. 40, no. 1, 1965, 21-24

TOPIC TAGS: ionization, ionization loss, thin film, thin plate, dielectric constant, charged particle

ABSTRACT: A more detailed analysis was made on effects of film density on ionization energy losses than the analysis done previously by the senior author (ZhETF 37, 527, 1959). Consider a particle of charge  $e$  and velocity  $v$  moving perpendicularly through a plate of thickness  $a$  and dielectric constant  $\xi(\omega)$ . The general expression for the work done by the radiation force field on the particle before, during, and after passage through the plate is given by

$$W = W_0 + w_1 + W_2 = -\frac{2e^3}{\pi v^3} \iint \frac{x^3 dx \cos \lambda a}{2e \lambda_0 \cos \lambda a - i(e \lambda_0^2 + \lambda^2) \sin \lambda a}$$

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ACCESSION NR: AP5008830

$$\left[ \lambda_0 \left( Z^2 \frac{v^2}{\omega^2} + P^2 \frac{1}{\lambda_0^2} \right) \left( \cos \lambda a - \cos \frac{\omega}{v} a \right) - i \left( Z^2 \frac{v^2}{\omega^2} \frac{\lambda}{\epsilon} \sin \lambda a - 2 Z P \frac{v}{\omega} \sin \frac{\omega}{v} a + P^2 \frac{\epsilon}{\lambda} \sin \lambda a \right) \right], \quad (1)$$

where

$$\begin{aligned} Z &= \frac{1}{\Lambda_0} - \frac{1}{\Lambda}, & P &= \frac{1}{\Lambda_0} - \frac{1}{\epsilon \Lambda}, & \lambda^2 &= \frac{\omega^2}{c^2} \epsilon - k^2, \\ \lambda_0^2 &= \frac{\omega^2}{c^2} - k^2, & k^2 &= x^2 + \frac{c^2}{v^2}, & \Lambda_0 &= k^2 - \frac{\omega^2}{c^2}, & \Lambda &= k^2 - \frac{\omega^2}{c^2}. \end{aligned} \quad (2)$$

The plate thickness is assumed to be small, and equation (1) is expanded in powers of  $a$ . The resulting expression for  $W_1$  is then integrated and for the case  $v^2 > c^2/\epsilon_0$ , and the equation

$$W_{(1)} = - \frac{\sigma e^2}{v^2} a \left[ \ln \frac{x_0 v}{\sqrt{1-\beta^2} \epsilon_1} - \frac{1}{2} \beta^2 \right] + \frac{\sigma e^2}{v^2} a \ln \frac{x_0 v}{\sqrt{\sigma} \beta}, \quad (3)$$

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ACCESSION NR: AF5008830

$$\ln \omega_1 = \frac{\int_0^{\infty} \omega e^{\omega} \ln \omega d\omega}{\int_0^{\infty} \omega e^{\omega} d\omega}$$

is obtained. It is observed that for a thin plate the ionization loss has a logarithmic increase. It is then shown quantitatively that the condition under which a plate may be assumed to be thin is given by

$$a \ll \frac{2c\Omega}{\sigma} \left( \ln \frac{V_0}{\sqrt{1-\beta^2}\omega_1} - \frac{1}{2} \right). \quad (4)$$

Orig. art. has: 10 equations.

ASSOCIATION: Fizicheskiy institut, GKAE (Physical Institute, GKAE)

SUBMITTED: 16Jun64

ENCL: 00

SUB CODE: NP

NO REF Sov: 004

Cord 3/3 843

OTHER: 000

"APPROVED FOR RELEASE: 07/19/2001

CIA-RDP86-00513R000514320012-3

GARIBYAN, K.Ye.; RYABOV, L.I.

High voltage sources for electric painting of wooden artivles.  
Der. prom. 13 no.2:13-14 F '64. (MIRA 17:3)

APPROVED FOR RELEASE: 07/19/2001

CIA-RDP86-00513R000514320012-3"

"APPROVED FOR RELEASE: 07/19/2001

CIA-RDP86-00513R000514320012-3

GARIB'YAN, R.B. ; MARKOV, N.G.

[Human anatomy and physiology; textbook for teachers' institutes]  
Anatomia i fiziologija cheloveka; uchebnik dlja pedagogicheskikh  
uchilishch. Izd.2, ispr. Moskva, Gos.uchebno-pedagog.izd-vo  
Ministerstva presvashchenija PSSR, 1953. 246 p. (MLRA 9:1)  
(ANATOMY, HUMAN) (PHYSIOLOGY)

APPROVED FOR RELEASE: 07/19/2001

CIA-RDP86-00513R000514320012-3"

"APPROVED FOR RELEASE: 07/19/2001

CIA-RDP86-00513R000514320012-3

GARIB'YAN, R.B.; NIKOLAYEVA, N.I.

Ivan Sergeevich TSitovich, obituary. Zh. vys. nerv. deiat. 5 no.6:  
930-931 N-D '55. (MLRA 9:3)

(TSITOVIDCH, IVAN SERGEVICH, 1876-1955)

APPROVED FOR RELEASE: 07/19/2001

CIA-RDP86-00513R000514320012-3"

USSR / Human and Animal Physiology. Physiology of Work T  
and Sport.

Abs Jour: Ref Zhur-Biol., No 22, 1958, 102343.

Author : Petrusenko, R.; Garib'yan, R. B.; Bugayev, K. Ye.  
Inst : Rostov on-the-Don State Ped. Institute.  
Title : The Significance of Central and Peripheral Vision  
in Flat Foot-Race for the 60 Meter Distance.

Orig Pub: Sb. stud. nauchn. rabot. Rostovak.-n/D. gos. ped.  
in-t, 1957, vyp. 1 (22), 89-95.

Abstract: No abstract.

Card 1/1

118

"APPROVED FOR RELEASE: 07/19/2001

CIA-RDP86-00513R000514320012-3

GARIB'YAN, Ruben Bakhshiyevich; MARKOV, N.G.

[Human anatomy and physiology: a textbook for the 8th grade in secondary schools] Anatomija i fiziologija cheloveka; uchebnik dlja 8 klasse srednej shkoly. Izd.4. Moskva, Gos.uchebno-pedagog. izd-vo, 1959. 206 p. (MIRA 13:7)  
(ANATOMY, HUMAN) (PHYSIOLOGY)

APPROVED FOR RELEASE: 07/19/2001

CIA-RDP86-00513R000514320012-3"

GARIBYAN, S., khudozhnik-konstruktor

Industrial X-ray apparatus. tekhn. est 2 no.7:9-11 .71 '65.  
(MIRA 18:8)  
1. Spetsial'noye khudozhestvenno-konstruktorskoye byuro Leningrad-  
skogo soveta narodnogo khozyaystva.

VARAPETYAN, G.A.; GRIBYAN, T.A.; DEMEKHINA, N.A.; MURADYAN, R.G.;  
KHUDAVENDIYAN, A.G.

Properties of levels and radiations of odd  $\text{Cs}^{131}$  and  $\text{Cs}^{133}$  nuclei. Izv. AN SSSR. Ser. fiz. 28 no.10;1657-1663 O '64.  
(MIRA 17:12)

I. Fizicheskiy institut Gosudarstvennogo komiteta po ispol'zovaniyu atomnoy energii SSSR.

ACCESSION NR: AP4009086

S/0056/63/045/006/1720/1726

AUTHOR: Vartapetyan, G. A.; Khudaverdyan, A. G.; Garibyan, T. A.

TITLE: Collective effects in the Cs-131 nucleus.

SOURCE: Zhurnal eksper. i teoret. fiziki, v. 45, no. 6, 1963, 1720-1726

TOPIC TAGS: Cesium 131, cesium 131 nucleus, collective effects, rotational motion, vibrational motion, single particle motion, even even nucleus, energy level scheme, odd A nucleus, shell model calculation, independent particle model

ABSTRACT: New experimental data on Cs<sup>131</sup> are reported. These include a new 907 keV transition, a half-life  $<2 \times 10^{-9}$  sec for the 1039 keV transition, and a ratio  $14.5 \pm 3$  for the intensities of the 918 and 907  $\gamma$  transitions. The observed E2 transitions (124, 133, and 495 keV) are found to be accelerated compared with the indepen-

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ACCESSION NR: AP4009086

dent-particle model, thus pointing to the existence of collective effects in the  $Cs^{131}$  nucleus. It is shown that the intensity ratio of the 918 and 907 keV  $\gamma$  transitions and the characteristics of the 133 keV level are not accounted for by the pure rotational model of L. W. Person and J. P. Rasmussen (Nucl. Phys. v. 36, 666, 1962), and this level cannot have an assignment  $7/2^+$ . It is concluded that the internal structure of the  $Cs^{131}$  nucleus is changed when it decays from the 124 keV level to the ground state, and it is suggested that the calculations of Person and Rasmussen be repeated with account taken of the existence of two close-lying independent-particle levels (ground and excited 124-keV levels). A more adequate model should take into account the interactions of the rotational, vibrational, and independent-particle motions. "In conclusion, the authors wish to thank A. I. Alikhanyan for his interest, and E. Muradyan, A. A. Tashchyan, and N. Demekhina for assistance with the measurements." Orig. art. has: 3 figures, 7 formulas, and 2 tables.

Card 2/3 2

L 14493-65 EMT(n) DIAAP/AFWL/SSD/ESD(t)  
ACCESSION NR: AP4048636

S/0048/64/028/010/1657/1663

AUTHOR: Vartapetyan, G.A.; Garibyan, T.A.; Demokhina, N.A.; Muradyan, E.G.; Khudaver-  
dyan, A.G.

TITLE: Properties of the levels and radiations of the odd-A nuclei Cs<sup>131</sup> and Cs<sup>133</sup>  
/Report, Fourteenth Annual Conference on Nuclear Spectroscopy held in Tbilisi 14-22  
Feb. 1964/

SOURCE: AN SSSR. Izv. Seriya fizicheskaya, v.28, no.10, 1964, 1657-1663

TOPIC TAGS: nuclear physics, nuclear radiation, nuclear structure, gamma emission

ABSTRACT: Delayed  $\gamma$ -coincidence measurements were performed with Cs<sup>131</sup> (and in one case with Cs<sup>133</sup>) in order to obtain information concerning the nature of the excited states and the extent to which they involve collective motions. KI crystals were used in a delayed coincidence circuit with a resolving time of  $10^{-8}$  sec. The performance of the circuit was checked by observing prompt coincidences from Co<sup>60</sup>. With the aid of the known different lifetimes of the 124 and 133 keV Cs<sup>131</sup> levels, it was determined from the delayed coincidence measurement results that the 1039 keV level decays almost 15 times more frequently to the 124 keV level than to the

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L 14493-65  
ACCESSION NR: AP4048636

133 keV level. This contradicts conclusions drawn from the model of L.W.Persson and I.O.Rasmussen (Nucl.Phys.36,166,1962). The half-life of the 620 keV Cs<sup>131</sup> state was measured by triple KX30- $\gamma$ 495- $\gamma$ 124 coincidences, and that of the 438 keV Cs<sup>133</sup> state was measured by a similar method. Both half-lives were found to be less than  $1.5 \times 10^{-10}$  sec. The half-life of the 1039 keV Cs<sup>131</sup> state was found by delayed KX30- $\gamma$ 1039 coincidences to be less than  $2 \times 10^{-9}$  sec. The half-life of the 133 keV Cs<sup>131</sup> state was found to be  $13.5 \times 10^{-9}$  sec; this is in agreement with the finding of E.Bodenstedt et al. (Nucl.Phys.20,557,1960). The angular correlation of the 495 and 124 keV  $\gamma$ -rays of Cs<sup>131</sup> was examined and an anisotropy of the order of 0.01 was found. It is concluded that the decay of the 124 keV level is 97% by M1 transition and 3% by E2. The ratio of the reduced E2 width to the theoretical value for a single-particle state was found to be greater than 4.5 for the 356 keV Cs<sup>133</sup> state, greater than unity for the 495 keV Cs<sup>131</sup> state, and approximately 6 for the 133 keV Cs<sup>131</sup> state. These estimates are in satisfactory agreement with calculations of R. Sorensen (Phys.Rev.133,B281,1964) in which nucleon pairing and collective vibrations were taken into account. The significance of these findings for models of odd-A nuclei is discussed. "In conclusion the authors express their gratitude to A.I.Alikhanyan for his interest in the work." Orig.art.has: 2 formulas, 4 figures and 3 tables.

2/3

L 1487.65

ACCESSION NR: AP:4048636

ASSOCIATION: Fizicheskiy institut Gosudarstvennogo komiteta po ispol'zovaniyu atomnoy energii SSSR (Physics Institute, State Committee on the Uses of Atomic Energy, SSSR)

SUBMITTED: OO

ENCL: OO

SUB CODE: NP

NR REF Sov: 005

OTHER: 020

3/3

"APPROVED FOR RELEASE: 07/19/2001

CIA-RDP86-00513R000514320012-3

GARIBYAN, Z.M.

Electric activity of the heart in chronic tonsillitis. Zhur.  
eksp. i klin. med. 5 no.1:67-73 '65. (MIRA 18110)

APPROVED FOR RELEASE: 07/19/2001

CIA-RDP86-00513R000514320012-3"

"APPROVED FOR RELEASE: 07/19/2001

CIA-RDP86-00513R000514320012-3

GARIBYAN, Z.M.

Electromechanical activity of the heart following tonsillectomy.  
Izv. AN Arm. SSR. Biol. nauki 18 no.2:87-91 F '65.  
(MIRA 18:5)

APPROVED FOR RELEASE: 07/19/2001

CIA-RDP86-00513R000514320012-3"

BOKOVA, Ye.N.; GARIBYANTS, A.A.

Bacteriological laboratory method of obtaining radioactive methane from  $\text{Cl}^{14}\text{O}_2$ . Mikrobiologiya 28 no.2:272-273 Mr-Ap '59. (MIRA 12:5)

1. Vsesoyuznyy nauchno-issledovatel'skiy geologorazvedochnyy neftyanoy institut.  
(METHANE,

laboratory bacteriol. prod. of radioactive methane from radiocarbon-labeled carbon dioxide (Rus)  
(CARBON DIOXIDE,  
same)

GARTCHIKIN, A. I.

"Rice Cultivation in the Salt-Containing Soils of Southern  
Mugana." Cand Agr Sci, Sci-Res Inst of Farming, Acad Sci  
Azerbaydzhan SSR, Baku, 1953. (RZhBiol, No 3, Oct 54)

Survey of Scientific and Technical Dissertations Defended at USSR  
Higher Educational Institutions (10)

So: Sum. No. 481, 5 May 55

"APPROVED FOR RELEASE: 07/19/2001

CIA-RDP86-00513R000514320012-3

MPP/VA. M.; VALUVA, P.; DUMITRESCU, Constantin; CARJCI, S.; POP, I.

Studies for designing the active parts of special plows.  
Bul St si Tehn Tim 8 no.1:195-203 Jan-Je '63.

APPROVED FOR RELEASE: 07/19/2001

CIA-RDP86-00513R000514320012-3"

GARIFOVA, R.

We shall justify the confidence. NTO 4 no.9:11-12 S '62.  
(MIRA 16:1)

1. Predsedatel' soveta Nauchno-tehnicheskogo obshchestva  
Chistopol'skogo sudoremontnogo zavoda.  
(Chistopol'—Ships—Maintenance and repair)

ACC NR: AR6034728 (n) SOURCE CODE: UR/0124/66/000/008/B124/B125

AUTHOR: Garifullin, F. A.; Vachagin, K. D.; Maminov, O. V.

TITLE: Flow of a non-Newtonian fluid in a centrifugal force field

SOURCE: Ref. zh. Mekhanika, Abs. 8B872

REF SOURCE: Sb. Materialy 2-y Konferentsii molodykh nauchn. rabotn. Kazani. Sekts. fiz.-tekhn. i mekhan.-matem. Kazan', 1965, 120-125

TOPIC TAGS: non Newtonian fluid, centrifugal force, non Newtonian flow, centrifugal force field, motion equation, biharmonic equation, liquid retardation velocity

ABSTRACT: A study was made of the flow of a non-Newtonian fluid (described by a rheological power equation) between two smooth cones rotating at the same angular velocity  $\omega$  and acting as models for separator nozzles for purifying liquids. The cones are coaxial and their generatrices are parallel. It is assumed that the distance between the cones is small in comparison with the length of the generatrices, the flow is symmetrical relative to the axis rotation, the angular velocity

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UDC: 532:5:532. 135

ACC NR: AR6034728

is so great that the effect of gravity may be ignored, and the relative acceleration is negligible. The motion of the fluid is analyzed within an orthogonal system of coordinates  $\{r, \varphi, z\}$ , whose axes are directed relative to the generatrix of the cone, along the tangent to the circumference in the cross-section of the cone, and perpendicular to the generatrix. The system of equations of motion is written for relative motion, and includes consideration of the effect of centrifugal and Coriolis forces. After a number of simplifying assumptions, a consideration of the intensity in velocity shift averaged for thickness, and a linearization of a system of equations, the problem is finally reduced to a solution of a biharmonic equation. The radial and tangential components of velocity are determined and the average velocity of liquid retardation and average radial velocity and pressure drop are computed. S. A. Bostandzhyan. [Translation of abstract]

[SP]

SUB CODE: 12/

Card 2/2

"APPROVED FOR RELEASE: 07/19/2001

CIA-RDP86-00513R000514320012-3

TOKAREV, V.A.; GARIFULIN, L.L.

Some moot questions in the pre-Cambrian geology of the Kola  
Peninsula. Izv.Kar. i Kol'.fil. AN SSSR no.4:175-178 '58.  
(MIRA 12:5)

(Kola Peninsula--Geology, Stratigraphic)

APPROVED FOR RELEASE: 07/19/2001

CIA-RDP86-00513R000514320012-3"

TOKAREV, V.A.; GARIFULIN, L.L.

Stratigraphy of the Kolmozero-Voron'ya series. Vop. geol. i  
min. Kol'. poluos. no.4:24-33 '63.

Genesis of amphibolites in the eastern part of the Kolmozero-  
Voron'ya series. 63:74 (MIRA 16:10)

"APPROVED FOR RELEASE: 07/19/2001

CIA-RDP86-00513R000514320012-3

NARODITSKIY, A.D.; GARIFULLIN, A.G.; CHERNOMORCHENKO, S.G.; MUSHKAREV, V.G.;  
KHASHBAKTIYEVA, D.A.

Thermal conditions of the first grid of a receiving amplifier tube  
of medium power. Nauch. trudy TashGu no.221.Fiz. nauki no.21:  
149-154 '63. (MIRA 17:4)

APPROVED FOR RELEASE: 07/19/2001

CIA-RDP86-00513R000514320012-3"

GARIFULLINA, A.Kh.

Vagrancy of bees in various seasons of the year. Vop. ekol. 7<sup>z</sup>  
37-38 '62. (MIRA 16:5)

1. Pedagogicheskiy institut, Kazan'.  
(Tatar A.S.S.R.—Bees)

"APPROVED FOR RELEASE: 07/19/2001

CIA-RDP86-00513R000514320012-3

GARIFULLINA, N.Kh. ; ZAKIROV, S.N. ; LAPUK, B.B. ; TREBIN, F.A. (Moscow) :

"The solution of problems of underground hydrogasdynamics by  
numerical methods".

report presented at the 2nd All-Union Congress on Theoretical and Applied  
Mechanics, Moscow, 29 Jan - 5 Feb 64.

APPROVED FOR RELEASE: 07/19/2001

CIA-RDP86-00513R000514320012-3"

ALKALAYEV, K.K., dotsent [REDACTED] N.V., assistant

Rare case of a mixed tumor of the hyoglossal salivary gland. Stomatologija 38 no.4:54-55 Jl-Ag '59. (MIRA 12:12)

1. Iz kafedry khirurgicheskoy stomatologii (zav. - dotsent K.K. Alkalayev) Irkutskogo meditsinskogo instituta (dir. - prof. A.I. Nikitin).  
(SALIVARY GLANDS--TUMORS)

GARIFULINA, N.V., assistant

Rare cases of injuries to the maxillofacial region inflicted by a  
bear. Stomatologija 41 no.4:92 Jl-Ag '62. (MIRA 15:9)

1. Iz kafedry khirurgicheskoy stomatologii (zav. - dotsent K.K.  
Alkalayev) Irkutskogo meditsinskogo instituta.  
(FACE—WOUNDS AND INJURIES)

ACC NR: AR6034728 (N) SOURCE CODE: UR/0124/66/000/008/B124/B125

AUTHOR: Garifullin, F. A.; Vachagin, K. D.; Maminov, O. V.

TITLE: Flow of a non-Newtonian fluid in a centrifugal force field

SOURCE: Ref. zh. Mekhanika, Abs. 8B872

REF SOURCE: Sb. Materialy 2-y Konferentsii molodykh nauchn. rabotn. Kazani. Sekts. fiz.-tekhn. i mekhan.-matem. Kazan', 1965, 120-125

TOPIC TAGS: non Newtonian fluid, centrifugal force, non Newtonian flow, centrifugal force field, motion equation, biharmonic equation, liquid retardation velocity

ABSTRACT: A study was made of the flow of a non-Newtonian fluid (described by a rheological power equation) between two smooth cones rotating at the same angular velocity  $\omega$  and acting as models for separator nozzles for purifying liquids. The cones are coaxial and their generatrices are parallel. It is assumed that the distance between the cones is small in comparison with the length of the generatrices, the flow is symmetrical relative to the axis rotation, the angular velocity

Card 1/2

UDC: 532:5:532.135

ACC NR: AR6034728

is so great that the effect of gravity may be ignored, and the relative acceleration is negligible. The motion of the fluid is analyzed within an orthogonal system of coordinates  $\{l, \varphi, x\}$ , whose axes are directed relative to the generatrix of the cone, along the tangent to the circumference in the cross-section of the cone, and perpendicular to the generatrix. The system of equations of motion is written for relative motion, and includes consideration of the effect of centrifugal and Coriolis forces. After a number of simplifying assumptions, a consideration of the intensity in velocity shift averaged for thickness, and a linearization of a system of equations, the problem is finally reduced to a solution of a biharmonic equation. The radial and tangential components of velocity are determined and the average velocity of liquid retardation and average radial velocity and pressure drop are computed. S. A. Bostandzhiyan. [Translation of abstract] [SP]

SUB CODE: 12/

Card 2/2

TAYCHINOV, S.N., prof.; VANYUKOV, Ya.I.; GALIMOV, G.F.; KURCHEYEV, P.A.; CHMELEV, M.P.; GARIFULLIN, F.Sh.; BURANGULOVA, M.N.; MOSEYeva, Z.V.; SHAROVA, A.S.; CHMELEV, M.P.; MAZILKIN, I.A.; GIZZATULLIN, S.G.; DOBROV, A.V.; KUZNETSOV, F.V.; FILATOV, L.P., red.; KOBYAKOV, I.A., tekhn.red.

[Soils of the Mazhita Gafuri Collective Farm and their efficient utilization] Pochvy kolkhoza imeni Mazhita Gafuri i puti ikh ratsional'nogo ispol'zovaniia. Pod red. S.N.Taychinova. Ufa, 1960. 124 p. (MIRA 14:1)

l. Akademiya nauk SSSR. Bashkirskiy filial, Ufa. Institut biologii.  
(Bashkiria--Soils)

"APPROVED FOR RELEASE: 07/19/2001

CIA-RDP86-00513R000514320012-3

GAYSIN, Sh.A.; GARIFULLIN, F. Sh.; DOBROV, A.V.; RADTSEVA, G. Ye.

Agrophysical properties of certain soils in the northern forest-steppe of Bashkiria. Mat.po izuch. pochv Bash. ASSR no.1:23-34 '60.

(MIRA 14:3)

(Bashkiria--Soil physics)

APPROVED FOR RELEASE: 07/19/2001

CIA-RDP86-00513R000514320012-3"

GARIFULLIN, F. Sh.

Effect of cultivation of physical properties of the grey forest  
soils of Bashkiria. Mat. po izuch. pochv Bash. ASSR no.1:35-  
49 '60. (MIRA 14:3)  
(Bashkiria--Forest soils)

GARIFULLIN, I.Kh.

Use of infusions of Tanacetum vulgare in gastric and duodenal ulcer.  
Kaz.med.zhur. 40 no.6:93-95 N-D '59. (MIRA 13:5)

1. Iz 3-y gorodskoy klinicheskoy bol'nitay g. Kazani (nauchnyy rukovoditel' - prof. I.V. Donrachev, glavvrach ob'yedineniya - D.B. Dunayev).

(TANSY--THERAPEUTIC USE) (PEPTIC ULCER)

GARIFULLIN, I.Kh.

Liver function disorders in peptic ulcer before and after stomach resection. Kaz.med.zhur. 41 no.1:42-44 Ja-F '60. (MIRA 13:6)

1. Iz 3 gorodskoy bol'nitsy Kazani (nauchnyy rukovoditel' - prof. I.V. Domrachev, glavvrach - A.B. Dunayev).  
(LIVER) (PEPTIC ULCER)

GARIFULIN, L.L.

Find of diatomaceus sediments in the Magazin-Musyur Ridge region  
(northeastern part of the Kola Peninsula). Vop.geomorf. i geol.-  
osad.pokr.Kol'.poluost. 1:172-175 '60. (MIRA 15:1)  
(Kola Peninsula--Diatomaceous earth)

"APPROVED FOR RELEASE: 07/19/2001

CIA-RDP86-00513R000514320012-3

GARIFULIN, L.L.

Fossil fungi. Priroda 51 no.1:115-116 Ja '62. (MIRA 15:1)

1. Kol'skiy filial AN SSSR, Murmanskaya obl.  
(Fungi, Fossil)

APPROVED FOR RELEASE: 07/19/2001

CIA-RDP86-00513R000514320012-3"

GARIFULLINA, L., brigadir shtukaturov

We work without scaffolding. Na stroi. Ros. no.7:5 Jl '61.  
(MIRA 14:8)

1. Stroitel'nyy uchastok No.2 Ufimskogo stroitel'no-montazhnogo  
tresta №.3.

(Plastering)

"APPROVED FOR RELEASE: 07/19/2001

CIA-RDP86-00513R000514320012-3

UUK, B.B.; ZAKIROV, S.N.; GARIFULLINA, N.Kh.

Nonsteady flow of real gas in a deformed nonuniform bed to wells operating under given output conditions. Izv. vys. ucheb. zav., neft' i gaz 7 no.3:81-86 '64. (MIRA 17.6)

1. Moskovskiy institut neftekhimicheskoy i gazovoy promyshlennosti imeni akademika Gubkina.

APPROVED FOR RELEASE: 07/19/2001

CIA-RDP86-00513R000514320012-3"

LAPUK, B.B.; GARIFULLINA, N.Kh.; ZAKIROV, S.N.

Solving inverse problems of underground gas-dynamics by numerical methods taking into consideration the real properties of the gases and the porous medium. Izv. vys. ucheb. zav.; neft' i gaz 7 no.7: 65-70 '64.  
(MIRA 17:9)

1. Moskovskiy institut neftekhimicheskoy i gazovoy promyshlennosti im. akad. I.M. Gubkina.

LAPUK, B.B.; IUNTS, A.L.; ZAKIROV, S.N.; GARIFULLINA, N.Kh.

Generalized method for calculating problems of underground  
gas-hydrodynamics by numerical methods. Izv. vys. ucheb. zav.;  
neft' i gaz 8 no.1:87-90 '65.

(MIRA 18:2)

1. Moskovskiy institut neftekhimicheskoy i gazovoy promyshlen-  
nosti imeni akademika I.M. Gubkina.

GARIF'YANOV, N. S.

CA

5

Resonance paramagnetic absorption in a single crystal of gadolinium nitrate. N. S. Garif'yanov (Phys. Tech. Inst., Kazan), Doklady Akad. Nauk S.S.R. 84, 923-4 (1952); cf. Zavolzh. C.A. 46, 1708. — According to the theory of Kittel and Luttinger (C.A. 43, 1821) the  $Gd^{3+}$  ion, being in the  $5d_7$  state, and the spin-orbital coupling being weak, should suffer in the elec. field of the crystal a small splitting  $\delta$  of the ground state, of the order of radio frequencies. The spectrum of resonance paramagnetic absorption in  $Gd^{3+}$  salt crystals should consist of a few lines, the position of which on the curve of the coeff. of paramagnetic absorption  $\chi''$  as a function of the static magnetic field  $H$  should permit detn. of the symmetry and direction of the intra-

cryst. elec. field and of  $\delta$ . Curves of  $\chi'' (H)$  were detd. by reflection in  $9.378 \times 10^6$  hertz for the orientations (100), (110), and (111), of a crystal of  $Gd(NO_3)_3 \cdot 6H_2O$  (I) relative to the octahedron formed by  $H_2O$ ; the salt is triclinic, contg. in the elementary cell, 2  $Gd$ , 6N, 18 O atoms, and 12 mols.  $H_2O$ . With pure I, the absorption lines are too broad for a resolution of the maxima. It is possible, however, with crystals grown from a satd. soln. contg. 1 wt. part of I with 10 parts of the diamagnetic  $La(NO_3)_3$ . The exptl. positions of the maxima were compared with those calcd. by the formulas of de Boer and Lieshout (C.A. 44, 2810d), with  $\delta = 0.176 \text{ cm}^{-1}$ , on the assumption of a cubic symmetry of the elec. field produced around the  $Gd^{3+}$  ion by the 6  $H_2O$  mols. Systematic deviations, in excess of possible exptl. errors, indicate that this assumption is not strictly valid. Paramagnetic resonance was observed also, in  $9.378 \times 10^6$ ,  $3.750 \times 10^6$ ,  $4.882 \times 10^6$ ,  $2.02 \times 10^7$ ,  $1 \times 10^7$  hertz, in powders of other salts of  $Gd^{3+}$ . All these salts gave a broad absorption band (width 2000-2300 cycles), with the effective  $g$  factor values: 1.3,  $Gd(NO_3)_3 \cdot 6H_2O$  2.1,  $GdCl_3 \cdot 6H_2O$  1.99,  $Gd_2O_3$  1.06. N. Then

GARIFYANOV N.S.

USSR.

1954. Paramagnetic absorption in some Gd salts in parallel fields. N. S. GARIFYANOV. Zh. Exper. teor. Fiz., 25, No. 342, 359-362 (1953). In Russian.

The applicability of Shaposhnikov's theory (*Dissertation, Moscow University, 1949*) and Gorter's empirical formula to the experimentally determined values of paramagnetic absorption in parallel fields at high frequencies ( $5\text{-}46 \times 10^6$  c/s) is checked. It is found that Gorter's formula does not describe the experimental curves at  $\sim 10^6$  c/s; Shaposhnikov's simplified formula  $\chi''/\chi_A = (1 - F)^2 p_{xy}$  applies very well to curves at  $\sim 10^6$  c/s. The magnetic heat-capacity constant  $b/C$  is calculated to be equal to  $5^2/0.41$ , where  $\beta$  is the half-width of the absorption band. This constant is  $3.82 \times 10^4$  Oe<sup>1</sup> for  $\text{Gd}_2(\text{SO}_4)_3 \cdot 8\text{H}_2\text{O}$ .

P. LACHMAN

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GARIF'YANOV, N. S.

USSR/Physics

Card 1/1 : Pub. 22 - 12/44

Authors : Garifyanov, N. S., and Kozyrev, B. M.

Title : ~~Superfine structure of paramagnetic resonance lines in solutions of Mn<sup>++</sup> and V<sub>2</sub>O<sub>5</sub> salts~~

Periodical : Dok. AN SSSR 98/6, 929-931, October 21, 1954

Abstract : Experimental studies of the superfine structure of paramagnetic resonance lines observed in solutions of Mn<sup>++</sup> and V<sub>2</sub>O<sub>5</sub> salts, when the latter were in a strong variable magnetic field, are described. Klystrons, which had generated the frequency of 9.444x10<sup>9</sup> cycles, were used for this experiment. Nine references; 3 USSR (1944-1953).

Institution : Physico-Technical Institute of the Kazan Branch of the Acad. of Scs. of the USSR

Presented by: Academician A. N. Terenin, June 1, 1954

GARIF'YANOV, N. S.

USSR/Physics - Paramagnetic resonance

FD-2217

Card 1/2      Pub 146-22/25

Author : Garif'yanov, N. S., and Zaripov, M. M.

Title : Hyperfine structure of the paramagnetic resonance of Tutton copper salt  
in intermediate fields

Periodical : Zhur. eksp. i teor. fiz. 28, 629-630, May 1955

Abstract : Up to the present time the hyperfine structure of the paramagnetic resonance of compounds of ferric elements has been investigated at high frequencies of the order ten billion cycles, in which region the resonance conditions for elements of the ferric group are fulfilled in strong magnetic fields, such fields permitting the splittings due to the interactions of the moments of the nuclei with the electrons. The authors note that at lower frequencies, in the decimeter and meter range, conditions are created that correspond to the Zeeman effect in intermediate and weak fields (S. A. Altshuler, B. M. Kozyrev, and S. G. Salikhov, DAN SSSR, 71, 1950; B. M. Kozyrev, Izv. AN SSSR, ser. fiz. 16, 1952), these investigations at low frequencies being used to verify the general theory of paramagnetic resonance absorption in crystals and also to determine precisely the constants of the hyperfine structure. In the present

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work the authors study the paramagnetic resonance in single-crystals of  $\text{CuK}_2(\text{SO})_2 \cdot 6\text{H}_2\text{O}$  diluted 1:200 by isomorphous zinc salt at frequency 526.74 million cycles at temperature of liquid air. Eight references: e.g. Ye. K. Zavoyskiy, Dissertation, Physics Institute, Acad. Sci. USSR, Moscow, '44.

Institution : Physicotechnical Institute of Kazan Affiliate, Academy of Sciences USSR.  
Kazan State University

Submitted : November 30, 1954

*GARIFYANOV, N.S.*

USSR/Chemistry - Physical chemistry

Card 1/1      Pub. 22 - 28/49

Authors : Garifyanov, N. S.

Title : Ferromagnetic resonance in silicate glass

Periodical : Dok. AN SSSR 101/3, 503-505, Mar 21, 1955

Abstract : Experiments were conducted to determine the ferromagnetic resonance in silicate glass with different  $Fe_2O_3$  and FeO contents. The measurements were made by the grid-current method with modulation of the constant magnetic field at frequencies ranging from  $9435 \cdot 10^6$  and  $534 \cdot 10^6$  to  $50 \cdot 10^6$  cps and temperature of 800-90° K. The results obtained are described in detail. Four references: 3 USSR and 1 English (1944-1954). Table.

Institution : Acad. of Sc., USSR, Kazan Branch, Phys-Techn. Inst.

Presented by : Academician A. N. Terenin, October 14, 1954

GARIF'YANOV, N. S.

USSR/ Physics - Paramagnetic resonance

Card 1/1 Pub. 22 - 11/46

Authors : Garif'yanov, N. S.

Title : Paramagnetic resonance in supercooled solutions

Periodical : Dok. AN SSSR 103/1, 41-43, Jul 1, 1955

Abstract : A theoretically-experimental study of the paramagnetic resonance phenomena is described. Supercooled solutions of  $\text{VO}^{++}$ ,  $\text{Mn}^{++}$ ,  $\text{Cu}^{++}$ ,  $\text{Fe}^{+++}$ ,  $\text{Ni}^{++}$  and  $\text{Co}^{++}$  were used for the study. Ethyl alcohol, glycerin and acetone were used as solvents. Magnetic spectra are described by the given formula:

$$\text{H}^* = \text{H}_0 - \text{A}_m - \frac{\text{A}^2}{2\text{H}_0} \left[ I(I+1) - m^2 \right] - \frac{\text{A}^2 m}{2\text{H}_0} (2M-1).$$

The symbols are also explained. Eight references: 1 Germ., 3 USA and 4 USSR (1951-1955). Graphs.

Institution : The Mathematical Institute of the Kazan' Affiliate of the Acad. of Sc., USSR

Presented by: Academician A. N. Terenin, May 9, 1955

GARIF'YANOV, N.S.

USSR/Magnetism - Magnetic Resonance, Physicotechnical Institute, Kazan Branch, Academy of Sciences USSR

Abst Journal: Referat Zhur - Fizika, No 12, 1956, 34978

Author: Garif'yanov, N. S., Kozyrev, B. M.

Institution: Physicotechnical Institute, Kazan' Branch, Academy of Sciences USSR

Title: Paramagnetic Resonance in Anthracite and Other Substances Containing Carbon

Original

Periodical: Zh. eksperim. i teor. fiziki, 1956, 30, No 2, 272-276

Abstract: Measurements were made at frequencies of 9,450, 536.71, 176.1, and 2 Mc. Electronic paramagnetic resonance gave a series of substances containing carbon (the name of the substance is followed by the half-width of the absorption curve in oersteds.); anthracite 0.8; coal 4.4; freshly prepared charcoal 4.8; petroleum asphalt 4.3; carbolite 3.8; black rubber 11. The g-factor for all the substances is independent of the frequency and equals  $2.004 \pm 0.002$ . The line widths are also independent of the frequency. In all the substances, the intensity of absorption increased by 3 times as the temperature was reduced from

Card 1/2

USSR/Magnetism - Magnetic Radiospectroscopy, F-6

Abst Journal: Referat Zhur - Fizika, No 12, 1956, 34978

Abstract: 295° K to 90° K, this being in agreement with the Curie law. All these facts indicate that probably, in all cases the effect is due to the free radicals, and not to the conduction electrons. At 90° K, a weak absorption with  $g \approx 2$  was observed in specimens of petroleum obtained from the deposits of Barly, TaSSR. In the anthracite specimens, it was observed that the electric conductivity affects the paramagnetic absorption: when the depth of the skin layer was smaller than the thickness specimen, the absorption curve became distorted and became similar to the dispersion curve; in such specimens this did not occur. These results are in qualitative agreement with the Bloembergen theory (Bloembergen, N. J., Applied Physics, 1952, 23, 1383), which so far was confirmed only for nuclear resonance.

Card 2/2

GARIF'YANOV, N.S.

CARD 1 / 2

PA - 1203

SUBJECT USSR / PHYSICS  
AUTHOR GARIF'JANOV, N.S., KOZYREV, B.M.  
TITLE The Relaxation Times  $T_1$  and  $T_2$  in Anthracite.  
PERIODICAL Žurn. eksp. i teor. fis., 30, 1160-1160 (1956) [Nat]  
Publ. 6 / 1956 reviewed 8 / 1956

When measuring the paramagnetic resonance in anthracite due to electrons for the first time, the authors found  $\Delta H = 0.7$  Oe for the half width of the corresponding absorption line. Thus, it is considerably less than in other kinds of mineral coal. A.A. MANENKOV found  $\Delta H = 0.3$  Oe in his dissertation. Apparently half width differs in different sorts of anthracite. The last measuring results obtained by the authors from samples of anthracite taken from the KUZNECK basin at frequencies of 12,25 and 22 kc were  $\Delta H = 0.5$  Oe.

For the determination of the spin lattice relaxation  $T_1$ , the degree of saturation was measured for various amplitudes of the oscillating magnetic field at the two aforementioned frequencies. The method was checked with  $\alpha$ -diphenyl- $\beta$ -picrylhydrazol, on which occasion  $T_1 = 6.6 \cdot 10^{-8}$  sec was obtained. Here the parameter  $T_2$  of the half width was assumed to be  $6.0 \cdot 10^{-8}$  sec, corresponding to the half width  $\Delta H = 0.75$  Oe of the line found with the monocrystal of the free radical mentioned. The amount  $T_1$  agrees well with the results obtained by

Zurn.eksp.i teor.fis, 30, 1160-1160 (1956) CARD 2 / 2

PA - 1203

N.BLOEMBERGEN and S.WANG, Phys.Rev. 93, 72, 1954 as well as by  
M.M.R.GABILLARD and J.A.MARTIN, C.R. 238, 2307 (1954). In the case of the  
samples of KUZNECK anthrazite  $T_1$  was  $12 \cdot 10^{-8}$  at  $T_2 = 1,4 \cdot 10^{-8}$  sec.

The theory of paramagnetic resonance in systems with great exchange interaction demands  $T_1 \sim T_2$ , and therefore the result found here confirms the

existence of a strong exchange in anthracite.  
In conclusion it must be pointed out that, at the temperature of liquid air,  
the relaxation time of anthracite becomes somewhat longer because in that  
case saturation occurs at smaller amplitudes of the oscillating field. This  
corresponds to the notion that, in anthracite, the "open valences" between  
the carbon atoms prove to be the carriers of paramagnetism.

INSTITUTION: Physical-Technical Institute of the KAZAN branch of the  
Academy of Science in the USSR.

GAROFANO N. S.

530.192

1468. HYPERFINE STRUCTURE OF THE LINES OF THE PARA-MAGNETIC RESONANCE IN COOLED SOLUTIONS OF  $V^{6+4}$ ,  $Cr^{3+4}$  AND  $Mn^{4+4}$ . N.S. Garofano.

Dokl. Akad. Nauk SSSR, Vol. 105, no. 4, 725-7 (1956). In Russian.  
The paramagnetic resonance spectra of ethyl alcohol solutions of  $Mn^{4+}Cl_4$ ,  $Cr^{3+}(NO_3)_3$ ,  $Cr^{3+}(NO_2)_3$ , and  $V^{4+}Cl_4$  were measured at 0°K at 520 Mc/s and lower frequencies down to 58 Mc/s. The low-field g values are in agreement with theory which gives

$$\delta_F = g_F [F(F+1) + J(J+1) - I(I+1)] / [2F(F+1)]$$

$Mn^{4+4}$  is in an  $^3S_{1/2}$  state, and  $I = 5/2$  and  $g_F = 1.0$  as observed. For the  $^3P_{1/2}$  state, as in  $Cr^{3+4}$  and  $V^{4+}$ ,  $J$  is replaced by  $S$  since the orbital contribution is quenched. For  $Cr^{3+4}$   $I = 3/2$  and  $g_F = 1$ ; the observed value falls from 3.0 at 520 Mc/s to 1.2 at 58 Mc/s. For  $Cr^{3+4}$   $I = 0$  and  $g_F = 2$ . For  $V^{4+4}$   $I = 7/2$  and  $g_F$  is F-dependent; a broad line is observed at  $g_F = 0.5$  (at 58 Mc/s) in accordance with expectation.

D.H. Whiffon

AUTHORS: Garif'yanov, N.S., Kozyrev, B.M. and Krivovyaz, I.M.  
(Institute of Chemistry of the Ac.Sc. of the Uzbek SSR).

TITLE: Free radicals during coking of the Angrensk coals.  
(Svobodnyye radikaly pri spekanii Angrenskikh ugley).

PERIODICAL: "Khimiya i Tekhnologiya Topliva i Masei" (Chemistry and  
Technology of Fuels and Lubricants), 1957, No.2,  
pp. 29-32 (U.S.S.R.)

ABSTRACT: The nature of binding forces appearing during coking  
of coal was investigated on an example of agglomeration  
of the Angrensk brown coal ground to 1-0 mm. The  
coal does not cake on heating, while briquettes made  
from this coal (pressed at 2000 kg/sq.cm), heated to  
900-1000°C produced coke similar in properties to one  
produced from a coking coal. Caking of a coking coal  
is often explained by its ability to pass into the  
plastic state on heating, but brown coals do not pass  
through this stage. The other explanation offered is  
an interaction of free radicals in the final stage of  
the coking process. It was expected by one of the  
authors that the interaction of free radicals during  
thermal treatment of non-caking coal fines and  
briquettes made from these fines should be different.  
Thus, paramagnetic resonance of thermally treated  
powdered Angrensk coal should be present as the coal  
particles do not react with each other, while in a

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Free radicals during coking of the Angrensk coals. (Cont.) similarly treated briquette it should disappear. To confirm this supposition measurements of paramagnetic resonance of the initial coal and that heated to 350, 550, 700, 750 and 900°C as well as similarly treated briquettes were carried out. Experimental results are given in Tables 2 and 3. Details of the experimental procedure are given. On heating powdered coal an increase in the paramagnetic resonance was observed, it attained maximum at 550°. On further heating it decreased and became unobservable after treatment at 950°. Samples which after an appropriate treatment were kept for four days in air, showed a much higher paramagnetic effect, the intensity of which was increasing with the temperature to which samples were heated (the width of the peak of the sample heated to 950°C was twice larger than that of the starting coal). Quite different results were obtained for briquetted coal. The paramagnetic effect disappeared after heating to 700 to 750°C and was not restored after four days. It is concluded that in powdered coal there were no suitable conditions under which an interaction of free radicals could take place, as individual particles were not brought closer either by pressing or by the presence

Card 2/3

Free radicals during coking of Angrensk coals. (Cont.)  
of plastic layer. In briquettes on the other hand, free  
radicals interacted during heating and this is confirmed  
by the disappearance of the paramagnetic effect. There  
are three tables and 9 references, 8 of which are Russian.

Card 3/3

"APPROVED FOR RELEASE: 07/19/2001

CIA-RDP86-00513R000514320012-3

GARIF'YANOV, N.S.

Refraction times  $T_1$  and  $T_2$  in anthracite. N. S. Garif'yanov and V. M. Kozhev. Soviet Phys. J.E.T.P. 3, 653 (1957) (English translation).—See C.A. 51, 1071b.

B.M.R.

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APPROVED FOR RELEASE: 07/19/2001

CIA-RDP86-00513R000514320012-3"

~~Approved for Release under the Freedom of Information Act~~~~DECLASSIFIED~~

GARIF'YANOV, N.

48-6-9/23

SUBJECT: USSR/Physics of Magnetic Phenomena

AUTHOR: Garif'yanov, N.S.

TITLE: Hyperfine Structure of Paramagnetic Resonance Lines in Over-cooled Solutions of Salts of the Iron Group (Sverkhtonkaya struktura liniy paramagnitnogo rezonansa v perekhlazhdennykh rastvorakh soley gruppy zheleza)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, 1957,  
Vol. 21, # 6, pp 824-827 (USSR)

ABSTRACT: The lines of paramagnetic resonance in overcooled solutions of some salts of the iron group were investigated as to their hyperfine structure.

The position of the hyperfine structure line in overcooled solutions of  $Mn^{2+}$  within the frequency band from 91 to 150 megacycles agrees well with the theoretical formula.Conditions for the Zeeman effect in weak fields are realized for  $^{55}Cr^{3+}$  at frequencies of  $f \leq 58$  megacycles.The same conditions are realized for  $V^{2+}$  at a frequency of  $\sim 100$  megacycles.

Card 1/3

48-6-9/23

## TITLE:

Hyperfine Structure of Paramagnetic Resonance Lines in Over-cooled Solutions of Salts of the Iron Group (Sverkhtonkaya strukture liniy paramagnitnogo rezonansa v perekhlazhdennykh rastvorakh soley gruppy zheleza)

The paramagnetic resonance was investigated in a silicon glass which contained 1 % of Mn<sub>2</sub>O<sub>3</sub>. A peak of hyperfine structure observed at a frequency of 92 megacycles is probably due to compounds of trivalent manganese.

A complicated spectrum of paramagnetic resonance is observed in overcooled solutions of VO<sup>2+</sup> in the frequency band from 58 to 600 megacycles; the number and position of absorption peaks greatly depends on the frequency of the oscillating field.

The great dependence of the position of the hyperfine structure line on the frequency of the oscillating field is observed also in overcooled solutions of Cu<sup>2+</sup>. Conditions corresponding to the Zeeman effect in weak fields arise at a frequency of 92 megacycles.

The article contains 1 figure and 4 tables.  
There are 11 references, 9 of which are Russian.

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48-6-9/23

TITLE: Hyperfine Structure of Paramagnetic Resonance Lines in Over-cooled Solutions of Salts of the Iron Group (Sverkhtonkaya struktura liniy paramagnitnogo rezonansa v perekhlazhdennykh rastvorakh soley gruppy zheleza)

ASSOCIATION: Physico-Technical Institute of the Kazan' branch of the USSR Academy of Sciences

PRESENTED BY:

SUBMITTED: No date indicated

AVAILABLE: At the Library of Congress

Card 3/3

1. Fiziko-Tekhnicheskij inst. Kazanskogo Filiala Akad. Nauk SSSR;

AUTHOR  
TITLE  
PERIODICAL

GARIF'YANOV, N.S.

Paramagnetic Resonance in Alkali Metals. (Russian)  
Zhurnal Eksperimental'noi i Teoret. Fiziki, 1957, Vol 32, Nr 1, pp 149-149  
(U.S.S.R.)

ABSTRACT

Received 3/1957

PA - 2032

Reviewed 3/1957

Paramagnetic resonance absorption due to conductivity electrons in metals was studied by several authors (cited here). The author investigated the dependence of the breadth of the curve of the resonance absorption of electrons on the dimensions of the particles of metallic lithium which contains approximately 5% admixtures of various metals. Measurements were carried out at frequencies of 9350, 400, 225, 91, and 35 kc of the oscillating magnetic field with such samples in which the average dimensions of the lithium particles changed within wide limits. Investigation methods were already described previously in a work by R.A.LEVY, Phys.Rev.98, 264 A (1955).

According to these measurements the width  $\Delta H$  of the curve of resonance absorption gradually changes from 20 to 3 frstd in metallic lithium if the average dimensions of the metal particles are diminished from  $\sim 50$  to 0,1 microns.

The width of the curve and the intensity of the absorption in a lithium sample with average particle dimensions of  $\sim 0,1$  microns remain constant within the frequency range of from 9500 to 35 kc as well as in the temperature range of from 300 to 90° K. In lithium samples with larger particle dimensions the breadth of the line also does not depend on frequency and

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PA - 2032

Paramagnetic Resonance in Alkali Metals.

temperature, and only a distortion of the shape of the resonance absorption which depends on the ratio of particle dimensions and on the depth of the skin layer is observed. (This is illustrated by an attached drawing). At the frequency of 35 kc it was possible to show by means of the saturation method that the time of spin-lattice relaxation becomes longer with a reduction of particle dimensions. The amount of the g-factor was determined in a sample with the average particle dimensions 0,1 micron at a frequency of 9500 kc and amounted to  $g = 2,002 \pm 0,002$ . In a sample of sodium with the average particle dimension 0,1 micron with 5% admixture a curve of resonance absorption with  $\Delta H = 110$  oersted and  $g = 2,002 \pm 0,002$  is observed at all investigated frequencies. In the sample the temperature dependence of the width  $\Delta H$  agrees well with the results obtained by the works by A.W. GUTOWSKY, P.J.FRANK, Phys. Rev. 94, 1067 (1954) and G.FEHÉR, A.F.KIP, Phys. Rev. 98, 337 (1955). On one sample of metallic potassium no paramagnetic resonance was found to exist.

ASSOCIATION Physical-Technical Institute of the Kazan' Branch of the Academy of Sciences of the USSR.

PRESENTED BY

SUBMITTED

AVAILABLE Library of Congress

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AUTHOR  
TITLE

N.S. GARIF'YANOV

PA - 2982

The Occurrence of Additional Absorption Peaks in  
Electron Resonance at Conditions of Saturation.  
(Vozniknoveniye dopol'nitel'nykh pikov pogloshcheniya  
v elektronnom rezonansse v usloviyakh nasyshcheniya.-  
Russian)

PERIODICAL

Zhurnal Eksperim. i Teoret. Fiziki 1957, Vol 32,  
Nr 3, pp 609 - 609 (USSR)

Received: 6/1957

Reviewed: 6/57

ABSTRACT

B. SMALLER noticed a splitting up of the nuclear  
resonance line in the case in which the modulation  
frequency of the magnetic field was of the same order  
of magnitude as the width of the line (expressed in  
frequency units). The author further noticed additional  
peaks of the same nature as in the case of electron  
resonance absorption. These additional peaks occur  
on the occasion of additional loads, if the angle  $\alpha$   
between the magnetic component  $H_x$  of the radar frequency  
field is different from  $90^\circ$ . Measurements were carried out at room temperature by  
means of the grid current method developed by

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The Occurrence of Additional Absorption Peaks in  
Electron Resonance at Conditions of Saturation.

E.K. ZAVOYSKIY within the frequency range of from 3 to 300 megacycles Doubled curves of resonance absorption were observed on the screen of the oscillograph. Doubling occurred as a result of the application of a magnetic alternating field with the frequency of 50 megacycles.

Only the ordinary peak of resonance absorption with  $\epsilon_{ef} = h / \beta H_0 = 2$ . was observed in the free radical  $\alpha$ -diphenyl -  $\beta$ -trinitrophenyl-hydrazyl at a low level or on the occasion of a modification of the angle  $\alpha$  from  $90^\circ$  to  $0^\circ$ . The intensity of this peak is a maximum at  $\alpha = 90^\circ$  and equal to zero at  $\alpha = 0$ . In the case of a high level of the power, however, additional absorption peaks occur in this free radical at  $\alpha < 90^\circ$  which are due to the modulation of the static magnetic field  $H_0$  which is parallel to the component  $H$ . The number and the position of these peaks depends upon the angle  $\alpha$  and upon the level of the power; it applies

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The Occurrence of Additional Absorption Peaks in  
Electron Resonance at Conditions of Saturation.

$\omega = \omega_0 + n\pi$  with  $n = 1, 2, 3, \dots$

Also in the KUZNRTSK bason and in metallic lithium  
additional peaks could be observed. The above is a  
translation of this short report.

(2 illustrations)

ASSOCIATION: Physical-Technical Institute of the KAZAN' Branch  
of the Academy of Science of the U.S.S.R.

SUBMITTED: 24. 11. 1956.

PRESENTED BY: -

AVAILABLE: Library of Congress.

CARD 3/3

AUTHOR  
TITLE

GARIF'YANOV, N.S., ZARIPOV, M.M., KOZYREV, B.M.,  
On the Value of the Spin of the Fe<sup>57</sup>Nucleus.  
(O znachenii spina yadra Fe<sup>57</sup> - Russian).

20-6-15/59

PERIODICAL

Doklady Akademii Nauk SSSR, 1957, Vol 113, Nr 6, pp 1243-1243 (U.S.S.R.)

ABSTRACT

The authors of the paper under review conducted measurements of the paramagnetic resonance in a congealed vitreous solution of borax, this solution contained iron. The cylindrical samples were obtained by melting together 5 mg of FeCl<sub>3</sub>.6H<sub>2</sub>O and 4 g of borax. Sample # I contained an iron which had been enriched with the isotope Fe<sup>57</sup> up to a concentration of 71.91%, whereas the analogous sample # II contained the common mixture of isotopes that had not been enriched. The measurements were conducted at 77° K at the frequencies of 115, 240 and 430 megacycles, and they were carried out with the aid of the method of the grid current, with the constant magnetic field H being modulated. The amount of the effective g-factor, the asymmetrical shape of the curves χ(H), and the widening of these curves at frequency multiplication (all these phenomena can be observed in sample # II) permit to draw the following conclusion: The ion Fe<sup>+++</sup> is under conditions that are analogous to the conditions in the derivatives of haemoglobin. It is probable that also in the case considered in the paper under review the lowest Kramers doublet ( $M_s = \pm 1/2$ ) is in a considerable distance from the other sublevels. In such a case, taking into account the low frequencies employed in this investigation, one has to expect that the maximum of the absorption corresponds to the effective g-factors ~ 4, as a matter of fact, this was also observed in the experiments car-

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On the Value of the Spin of the Fe<sup>57</sup> Nucleus.

20-6-15/59

ried out with the sample # II. For the enriched sample # I, the curves  $\chi$ " (H) are at all three frequencies much wider than the corresponding curves for the sample # II. In sample # I, there can be observed next to the main maximum of absorption a poorly resolved additional maximum which is located at lower field intensities than the main maximum. The maximum of the sample # II lies between these two maxima.

These results can be explained by a nuclear spin  $I = 1/2$  of the isotope Fe<sup>57</sup>. The constant of the hyperfine structure amounts to approximately 10 gauss and is slightly anisotropic. This value by several times larger than the values obtained in earlier investigations. Such increase of the constant of the hyperfine structure is possible because the large initial splitting must be caused by an admixture of excited states, particularly of the state 3d<sup>3</sup>ls.

(No reproductions).

ASSOCIATION Physical-Technological Institute, Kazan Branch, Academy of Science of the  
USSR, and State University Kazan.  
PRESENTED BY ARTSIMOVICH L.A., Member of the Academy  
SUBMITTED 13.2.1957  
AVAILABLE Library of Congress  
Card 2/2

18(3)

AUTHOR:

Garif'yanov, N. S.

SOV/56-35-2-43/60

TITLE:

The Second Relaxation in a Spin System in Some Compounds of  
the Elements of the Iron Group (Vtoraya relaksatsiya v spin-  
sisteme v nekotorykh soyedineniyakh elementov gruppy zheleza)

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958,  
Vol 35, Nr 2(8), pp 530-532 (USSR)

ABSTRACT:

First, some previous papers are mentioned. C. J. Gorter and F. W. Frjor (Frijer) assumed that the maximum of the curve of spin-spin absorption in chromium-potassium alum at 20°K is caused by the relaxation between 2 spin-spin systems. This is the second relaxation in a spin system. Favorable conditions for the second relaxation are provided also by an irregular heating or ventilation (vyvetrivaniye) of some hydrated salts of Mn<sup>++</sup>, Fe<sup>+++</sup>, Cu<sup>+</sup>. In these salts, the ions located in different elementary cells have different surroundings and this fact causes the second relaxation in the spin system. There must be analogous conditions also in substances with a remanent antiferromagnetism. Indeed, in Mn(COCH<sub>3</sub>)<sub>2</sub>:

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SOV/56-35-2-43/60

The Second Relaxation in a Spin System in Some Compounds of the Elements  
of the Iron Group

$\text{FeNH}_4(\text{SO}_4)_2 \cdot \text{H}_2\text{O}$ ,  $\text{Fe}_2(\text{SO}_4)_3 \cdot 3\text{H}_2\text{O}$ ,  $\text{CuCl}_2$  (in the frequency range 600-150 megacycles) it was possible to find the absorption curves for parallel fields. These curves have a maximum of spin-spin absorption  $\chi''$  at a certain value of the parallel field  $H_{||}$ . For the above-mentioned substances, the place of the maximum does not depend on temperature (in the temperature interval  $300-90^\circ\text{K}$ ). But this maximum is displaced towards lower values of  $H_{||}$ , if the frequency  $\nu$  is diminished. For the above-mentioned salts, rather narrow resonance curves  $\chi''(H_{||})$  are observed at a frequency of 542 megacycles in

perpendicular fields, and this is an argument in favor of a partial exchange interaction between the ions. For sufficiently low values of  $H_{||}$ , absorption is due only to the second relaxation in the spin system. In the frequency interval 600-150 megacycles, it was possible to detect an absorption in  $\text{Cr}_2\text{O}_3$ ,  $\text{CuO}$  and  $\text{Nd}_2\text{O}_3$  at  $T = 90^\circ\text{K}$  and  $295^\circ\text{K}$  in perpendicular and also in parallel fields. Obviously, absorption in the oxides and anhydrous salts is due to the relaxation between the 2 antiferromagnetic sublattices which are partially con-

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SOV/56-35-2-43/60

The Second Relaxation in a Spin System in Some Compounds of the Elements  
of the Iron Group

served also above the Curie (Kyuri) temperature. Finally conditions are mentioned in which the second relaxation cannot be observed. There are 1 figure, 1 table, and 11 references, 8 of which are Soviet.

ASSOCIATION: Fiziko-tehnicheskiy institut Kazanskogo filiala Akademii  
nauk SSSR (Physico-Technical Institute of the Kazan' Branch,  
AS USSR)

SUBMITTED: May 10, 1958

Card 3/3

24(3), 5(4)

AUTHOR:

Garif'yanov, N. S.

SOV/56-35-3-3/6

TITLE:

Paramagnetic Relaxation in Potassium Chromium Sulphate  
and Ammonium Ferric Sulphate (Paramagnitnaya relaksatsiya  
v khromokaliyevykh i zhelezoammoniyevykh kvastsakh)

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958,  
Vol 35, Nr 3, pp 612 - 617 (USSR)

ABSTRACT:

The present paper was written in continuation of two previous publications by the same author (Refs 1,2), which dealt with investigations of spin-spin absorption in parallel fields  $H_{\parallel}$  at frequencies of 546 megacycles; moreover, a formula for absorption was derived, which originates from the formula developed by Shaposhnikov (Ref 3). The present paper deals with investigations of  $\text{CrK}(\text{SO}_4)_2 \cdot 12\text{H}_2\text{O}$  (I) and  $\text{FeNH}_4(\text{SO}_4)_2 \cdot 12\text{H}_2\text{O}$  (II) in which a magnetic alternating field having a frequency of 50 cycles and a maximum amplitude-height of 2500 Oe was used. (The measuring

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Paramagnetic Relaxation in Potassium Chromium  
Sulphate and Ammonium Ferric Sulphate

SCV/56-32-3-11

method employed is described in detail in reference 7). The results obtained with respect to a number of investigations of phase transitions carried out by the method of paramagnetic relaxation in the temperature interval of 90-300°K are given. Figure 1 shows the course of the absorption curve  $\chi''(H_a)$  at 90, 200, and 300°K as well as of  $\chi''(H_\perp)$  at the same temperatures in (I)-monocrystals; figure 2 shows the course of  $\chi''(H_a)$  at 90, 200, and 295°K, as well as of  $\chi''(H_\perp)$  at the same temperatures in monocrystals of (II). In the case of the investigation of (I) the frequency amounted to 545 and in that of (II) to 540 megacycles. Table 1 shows the dependence of the splitting of the spin-doublets on temperature etc. for the values 20, 90, 193 and 293°K. For the half-width of the absorption curves  $\Delta H_\perp$  the following values (Oe) were measured: (I): 400 (90°K), 500 (200°K); (II): 730 (90°K), 670 (200°K), 520 (295°K). For (I) the order of magnitude  $10^{-8}$  sec was found for the duration of spin lattice relaxation ( $\tau_L$ ) at 200°K and 545 megacycles, and at 300° the value

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Paramagnetic Relaxation in Potassium Chromium  
Sulphate and Ammonium Ferric Sulphate

SOV/56-35-3-3/

$5 \cdot 10^{-8}$  was found. For (II):  $\vartheta_L = 4 \cdot 10^{-8}$  sec ( $90^\circ K$ ),  
 $10^{-9}$  ( $200^\circ K$ ),  $\sim 10^{-8}$  ( $295^\circ K$ ). In conclusion, the author  
thanks B.M.Kozyrev for discussing results and Ye.I.  
Semenova for preparing the samples. There are 2 figures,  
2 tables, and 16 references, 11 of which are Soviet.

ASSOCIATION: Fiziko-tehnicheskiy institut Kasanskogo filiala Akademii  
nauk SSSR (Physico-Technical Institute of the Kazan' Branch  
of the Academy of Sciences USSR)

SUBMITTED: April 9, 1958

Card 3/3

24(3), 18(6)  
AUTHORS:

Garif'yanov, N. S., Starikov, M. A.

SOV/56-35-3-43/61

TITLE:

The Paramagnetic Electron Resonance in the Alloys of  
Alkali Metals (Elektronnyy paramagnitnyy rezonans v  
splavakh shchelochnykh metallov)

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958,  
Vol 35, Nr 3, pp 798 - 799 (USSR)

ABSTRACT:

Several earlier papers (Refs 1,2,3) deal with the influence exercised by impurities upon the resonance absorption in metals, which influence is due to that exercised by conductivity electrons. The authors investigated (on the frequency of 290 megacycles and at  $T = 90^{\circ}\text{K}$ ,  $\theta = 300^{\circ}\text{K}$ ) the resonance absorption in sodium alloys as a function of the concentration of the components. As components the metals Li, K, Hg, Pb and the Wood(Vud) alloy were used. The method of investigation has already been investigated in a previous paper (Ref 4). The production of samples is described in short. In the initial Na metal the width  $\Delta H$  (which was measured between points of the curve of resonance absorption which corresponds to the half intensity) amounts in the maximum to 16 Oersted at room temperature and to 9 Oersted at  $90^{\circ}\text{K}$ . The

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The Paramagnetic Electron Resonance in the Alloys of Alkali Metals SOV/56-35-3-43/61

data concerning  $\Delta H$  found here agree with the results obtained by H. S. Gutowsky (Gutovskiy) and P. J. Frank (Ref 6). The results obtained by measuring paramagnetic resonance in the alloys showed the following: The metals used as components of the alloys may be subdivided into 2 groups. The first group comprises the metals Li and K, which exercise a slight influence upon  $\Delta H$ , and, consequently, also upon  $T_1$  and  $T_2$  (as to the significance of  $T_1$  and  $T_2$  see the aforementioned previous paper). In the alloys Na-K  $\Delta H$  depends in a higher degree on temperature than in the initial metal. The second group comprises the heavy metals Hg, Pb and Wood's alloy, which enlarge  $\Delta H$  nearly  $10^4$  times as much as the metals of the first group. In the alloys of these metals  $\Delta H$  does not depend on temperature. The authors also investigated the paramagnetic resonance in lithium alloys. As components of these alloys Na, K, Hg, Pb and Wood's alloy are used. The alkali metals Na and K also exercise a weak influence upon lithium alloys. However, only 0,001% of the heavy components Hg and Pb and of the Wood's alloy broaden the line to such

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The Paramagnetic Electron Resonance in the Alloys  
of Alkali Metals

SOV/56-35-3-43/61

an extent that it is not possible to observe absorption in these alloys. The quantitative results obtained for these alloys are not given because of the insufficient purity of the initial metal. The results obtained agree with the theory developed by R. J. Elliott. In the conclusion, the authors thank K. A. Valiyev for discussing the results. There are 2 figures and 8 references, 3 of which are Soviet.

ASSOCIATION: Fiziko-tehnicheskiy institut Kazanskogo filiala Akademii nauk SSSR (Physico-Technical Institute of the Kazan' Branch of the Academy of Sciences, SSSR).

SUBMITTED: May 31, 1958

Card 3/3

AUTHORS:

Garif'yanov, N. S., Kozyrev, B. M.

20-118-4-31/61

TITLE:

The Influence of Oxygen on the Paramagnetic Resonance  
Absorption in  $\alpha\alpha$ -Diphenyl- $\beta$ -Picrylhydracyl  
(O vliyanii kisloroda na paramagnitnoye rezonansnoye  
pogloshcheniye v  $\alpha\alpha$ -difenil- $\beta$ -pikrilgidrazile)

PERIODICAL:

Doklady Akademii Nauk SSSR, 1958, Vol. 118, Nr 4,  
pp. 738-739 (USSR)

ABSTRACT:

The authors developed by a method described by them already earlier (reference 1) a strong influence of oxygen on the paramagnetic resonance absorption in  $\alpha\alpha$ -diphenyl- $\beta$ -picrylhydrazyl, which here was used as freshly pulverized, fine crystalline powder. When the air pressure above the test piece is reduced the intensity of the absorption line increases, its half-width, however, decreases. At an increase of the pressure to the original value the original absorption line is reproduced. The influence of oxygen on the intensity, width, and shape of the line shows up especially clearly in case of cooling down of the sample. The dependence of the half-width  $\Delta H$  of the absorbed lines

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The Influence of Oxygen on the Paramagnetic Resonance 20-118 -4-31/61  
Absorption in  $\alpha\alpha$ -Diphenyl- $\beta$ -Picrylhydracyl

on the temperature in the samples which are subjected to an air pressure of  $9 \cdot 10^{-4}$  and 760 torr is illustrated in a diagram. Further the photographs of several lines are added here. In case of absent oxygen only a very weak decrease of  $\Delta H$  on occasion of a heating of the sample from 77 to 395°K is observed. In case of a sample which is in contact with air the curve  $\Delta H$  is higher, whereon in the temperature interval from  $\sim 300$  to  $\sim 250^{\circ}\text{K}$  a sharp increase of the line width is observed. The experiments with the same sample are well reproducible. The various samples gave some what different results at an air pressure of 760 torr. An especially strong change of the absorption line is observed, when the finely pulverized sample is in direct contact with the liquid oxygen. But on occasion of contact with liquid nitrogen the dependence  $\Delta H(T)$  remains about the same as in case of the evacuated specimen. The here discussed experiments show that the change of the half-width is caused completely by the oxygen molecules which are absorbed on the surface of the  $\alpha\alpha$ -diphenyl- $\beta$ -picrylhydracyl. A widening of the line also was observed in an  $\text{NO}_2$ -atmosphere. In

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The Influence of Oxygen on the Paramagnetic Resonance 20-1184-31/61  
Absorption in  $\alpha\alpha$ -Diphenyl- $\beta$ -Picrylhydrazyl

$\alpha\alpha$ -diphenyl- $\beta$ -picrylhydrazyl the absorbed paramagnetic gases considerably shorten the period  $T_2$ , which determines the line width. The most important factor thereby is the strong change of the line width near 275°K, probably because of a change of the character of the motion of the  $O_2$ -molecules on the surface of the  $\alpha\alpha$ -diphenyl- $\beta$ -picrylhydrazyl. At temperatures above 275°K the adsorbed oxygen has a high free motion on the surface of the sample, whereas at temperatures below  $\sim 275$ °K the motion of the adsorbed molecules freezes. The adsorption of oxygen on the surface of  $\alpha\alpha$ -diphenyl- $\beta$ -picrylhydrazyl is the first stage of the oxydation of this free radical, but the oxydation itself takes place slowly.

There are 2 figures, and 9 references, 1 of which is Soviet.

ASSOCIATION: Fiziko-tehnicheskiy institut Kazanskogo filiala Akademii nauk SSSR (Kazan' Branch, AS USSR, Physical-Technical Institute)

Card 3/4

The Influence of Oxygen on the Paramagnetic Resonance 20-118-4-31/61  
Absorption in  $\alpha\alpha$ -Diphenyl- $\beta$ -Picrylhydracyl

PRESENTED: July 8, 1957, by B. A, Arbuzov, Member, Academy of Sciences

SUBMITTED: July 4, 1957

AVAILABLE: Library of Congress

Card 4/4

"APPROVED FOR RELEASE: 07/19/2001

CIA-RDP86-00513R000514320012-3

GARIF'YANOV, N.S.; AKSEL'ROD, M.M.

Magnetic resonance in some coals. Khim. i tekhn. i masel  
4 no.3:64-68 Mr '59. (MIRA 12:4)

1. Kazanskiy filial AN SSSR.  
(Coal--Magnetic properties)

APPROVED FOR RELEASE: 07/19/2001

CIA-RDP86-00513R000514320012-3"

29 (0)  
AUTHOR:

Garif'yanov, N. S.

SOV/56-36-6-66/66

TITLE:

On Resonance Transitions in Parallel Fields in Some  $Mn^{++}$ - and  
 $Fe^{+++}$ -Salts (O rezonansnykh perekhodakh v parallel'nykh polyakh  
v nekotorykh solyakh  $Mn^{++}$  i  $Fe^{+++}$ )

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36,  
Nr 6, pp 1957 - 1958 (USSR)

ABSTRACT:

Kurushin and Kutuzov (Refs 1,2) found that with a frequency of  $\gamma \sim 10^{10} \text{ sec}^{-1}$  at room temperature the absorption curves  $\chi''(H)$  have a maximum in some  $Mn^{++}$ - and  $Fe^{+++}$ -salts, when investigated in parallel fields (the oscillating field  $H_\nu$  is parallel to the constant field  $H$ ). This absorption was explained as a spin-spin absorption, and was identified with the phenomenon discovered by Gorter et.al. (Ref 3). It was also found that the experimental curve  $\chi''(H)$  does not correspond to the theory developed by Shaposhnikov (Ref 4). The author of the present "Letter to the Editor" is of the opinion that the absorption maximum in the curve  $\chi''(H)$  in the case of parallel fields is not based

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On Resonance Transitions in Parallel Fields in Some  
 $Mn^{++}$ - and  $Fe^{+++}$ -Salts

SOV/56-36-6-66/66

upon spin-spin relaxation, but has resonance character. As it is known that a resonance peak is observed in these salts at room temperature in fields which are perpendicular to each other, the author investigated the course of the  $\chi''(H)$ -curve at a frequency of 9500 cycles at  $T = 295^{\circ}$  in  $FeNH_4(SO_4)_2 \cdot 12H_2O$  during transition from perpendicular to parallel fields; he found that indeed a resonance peak must be concerned. There are 5 references, 4 of which are Soviet.

ASSOCIATION: Fiziko-tehnicheskiy institut Kazanskogo filiala Akademii nauk SSSR (Physico-technical Institute of the Kazan' Branch of the Academy of Sciences, USSR)

SUBMITTED: April 9, 1959

Card 2/2

24.2200, 24.6400,  
24.7900

76967  
SOV/56-37-6-7/55

AUTHOR: Garif'yanov, N. S.

TITLE: Paramagnetic Resonance in Magnetically Diluted Systems

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki,  
1959, Vol 37, Nr 6, pp 1551-1557 (USSR)

ABSTRACT: The dependence of the ratio of the constants b/c on the degree of dipole-dipole magnetic interactions was investigated by the paramagnetic resonance method in parallel fields (cf. N. S. Garif'yanov, Zhur. eksp. i teoret. fiz., 35, 612, 1958). The measurements were carried out in the frequency range from 300 to 1.6 megacycles/sec at T = 90° K in samples containing Cr<sup>+++</sup>, Fe<sup>+++</sup>, Mn<sup>++</sup>, Cu<sup>++</sup>, and VO<sup>++</sup>. In samples containing Cr<sup>+++</sup> (S = 3/2), Fe<sup>++</sup>, and Mn<sup>++</sup> (S = 5/2), the heat capacity of the spin system depended on both the splitting of levels in the electric crystal field and the dipole-dipole magnetic interactions. In the

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Paramagnetic Resonance in Magnetically  
Diluted Systems

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first approximation the total heat capacity can be represented as the sum  $b = b_{\text{electric}} + b_{\text{magnetic}}$ . In the samples containing  $\text{Cu}^{++}$  and  $\text{VO}^{++}$  ( $S = 1/2$ ), the heat capacity related to the splitting of levels in the electric field was absent:  $b = b_{\text{magnetic}}$   $b_{\text{electric}} = 0$ . It was assumed that in the magnetic dilution the electric field of crystal lattice or the medium surrounding the magnetic ion is practically retained and the magnetic interactions will depend on the degree of the dilution. The magnetically diluted  $\text{Fe}^{+++}$  and  $\text{Cr}^{+++}$  systems exhibited a large initial splitting of spin sublevels in the electric field of the crystal,  $\delta \sim 0.2 \text{ cm}^{-1}$ . Therefore, it would be expected that the portion of heat capacity due to  $b_{\text{electric}}$  should be greater than  $b_{\text{magnetic}}$ . However, the magnitude of  $b/c$  decreased very much with a decrease of magnetic interaction, and the heat capacity owing to the splitting of levels in the

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electric field was absent; i.e., for samples containing Cr<sup>+++</sup> and Fe<sup>+++</sup> it can be assumed that S' = 1/2.

The same value was also obtained in the interpretation of the resonance absorption spectra in perpendicular fields. The experimental curves of spin-spin absorption in the magnetically diluted samples containing Cr<sup>+++</sup> and Fe<sup>+++</sup> were described by the Shaposhnikov theory (cf. Zhur. eksp. i teoret. fiz., 18, 533, 1948). The analysis of the absorption curves from spin-spin and spin-lattice relaxations indicated that in diluted systems Cr<sup>+++</sup> -Fe<sup>+++</sup> (0.03 mole/l) the time  $\rho_s$  remains increased linearly or as the square root of the concentration (cf. B. M. Kozyrev, Dissertation, Phys. Inst. Acad. Sciences USSR, Moscow, 1957). The relation

$\rho_s < \rho_1$  was also supported by two other factors: the spin-spin absorption curves were obtained always at

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higher frequencies,  $\nu$ , than the spin-lattice relaxation curves; and the curves  $\chi''(H_{\parallel})$  could be described by the Casimir-Du Pre equation, which holds true for cases when  $\rho_s \ll \rho_1$  (cf. Physica, 5, 507, 1938). The fact that at  $\sim 10^7$  cycles/sec  $\chi''(H_{\parallel})$  curves from the  $\text{Cr}^{+++}$ - $\text{Fe}^{+++}$  system can be obtained at  $90^\circ \text{ K}$ , whereas for magnetoconcentrated samples of  $\text{Cr}^{+++}$  and  $\text{Fe}^{+++}$  these curves would be apparent at  $T \sim 20^\circ \text{ K}$  (cf. L. J. Smits, H. E. Derkxen, J. C. Verstelle, C. J. Garter, Physica, 22, 773, 1956), was taken as an indication that with a decrease in the concentration of magnetic ions the period of spin-lattice relaxation increases. In different compounds of  $\text{Cr}^{+++}$  and  $\text{Fe}^{+++}$ , if  $h\nu \ll \delta$ , the relaxation period  $\rho_1$  depends on the magnitude of  $\delta$ , and the higher the magnitude of  $\delta$ , the larger the period  $\rho_1$ . Analogous results were obtained by the

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